



City of Seattle

Gregory J. Nickels, Mayor

Seattle Public Utilities

Chuck Clarke, Director

April 14, 2004

Gretchen Schmidt
USEPA
1200 6th Ave OEA-095
Seattle, WA 98101

Subject: Laboratory Analytical Results for Samples Collected at Boyer Alaska Barge Lines and Wells Trucking Properties.

Dear Ms. Schmidt:

Three sediment samples were collected from the above listed properties owned by Boyer Halverson on February 11, 2003. One sample (Boyer1) was collected from the forebay of the oil/water separator located in the north central portion of the property at 7318 4th Avenue South. This oil/water separator collects water from one catch basin and discharges directly to the Duwamish River. Two samples (Wells1 and Wells2) were collected from sediments removed from three catch basins on the Wells Trucking property at 7265 2nd Avenue South. The samples are duplicates and were collected from two 55-gallon drums containing the removed sediments. Please note that the three catch basins appear to be tidally influenced as water was backed up into the catch basins during several of my visits to the site.

If you have any questions or concerns regarding surface water quality, please contact me at (206) 615-1636 or at tanya.treat@seattle.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "Tanya P. Treat".

Tanya P. Treat, P.E.
Surface Water Quality Inspector

USEPA SF



1215670

	Wells 1 data	Wells 2 data	Bayer 1 data	
no TOC measured, no grain size				
Phthalates $\mu\text{g/kg}$				dilution required
Dimethyl	8,500U	4700U	3700U	
Diethyl	8500U	4700U	3700U	
Di-n-butyl	8500U	4700U	4,800	
Butyl benzyl	8500U	4700U	6400	
BEP	150,000	37,000	26,000	
Di-n-octyl	8500U	4700U	3,700U	
Metals mg/kg(dw)				not dilute sample
Arsenic	30	200	20	
Cd	9	5.2	603	
Cu	527*	312*	368* <u>see notes</u>	
Pb	157	421	308	
Hg	0.12	0.10	0.13	
Zn	2,570	729	1,120	
Aroclors kg/kg				non-dilute
1016	57U	47U	47U	
1242	57U	47U	47U	
1248	57U	47U	47U	
1254	130Y	100Y	47U	
1260	69Y	120	66	
1281	110U	93U	93U	
1232	57U	47U	47U	

Notes
KAT
7/14/04



Analytical Resources, Incorporated
Analytical Chemists and Consultants

26 February 2003

Ms. Tanya Treat
SPU
710 2nd Avenue
Seattle, Washington 98104

**RE: Client Project: Duwamish
ARI Job No. FF56**

*only use
data from
(re)analysis*

Dear Tanya:

Please find enclosed the original chain of custody record and the final results for the samples from the project referenced above. Analytical Resources, Inc. accepted three sediment samples on February 11, 2003. The samples were received intact and there were no discrepancies in the paperwork. The samples were analyzed for total metals, phthalates and PCBs as requested.

The areas for some internal standards and the percent recoveries for some surrogates were not within control limits following the initial phthalate analyses of these samples. All samples were diluted and re-analyzed. The areas for all internal standards were within acceptable QC limits for the re-analyses. The percent recoveries for some surrogates were still not within established control limits in isolated instances. This was attributed to matrix related interferences. The results for both analyses have been submitted for each sample for comparison.

A small amount of copper was detected in the method blank associated with the metals analyses of these samples. Copper was detected in all samples associated with this blank. Since the concentrations of copper found in all three samples were significantly greater than the amount measured in the blank, no corrective actions were taken.

There were no further analytical complications noted.

A copy of these reports and all supporting data will remain on file at ARI. If you have any questions or need additional information please contact me.

Sincerely,

ANALYTICAL RESOURCES, INC.

Mark D. Harris

Mark D. Harris
Project Manager
206/695-6210
mark@arilabs.com

*Some lab
contam. for
Cu, but not
a big deal.
Results should
still be flagged*

Enclosures
cc: File FF56
MDH/esj

Chain of Custody Record & Laboratory Analysis Request

Page 1 of 1

Turn Around Requested: STA
03-1519-21

[illegible]

Relinquished:	Received by:	Special Instructions/Notes	
(Signature)	(Signature)		
Printed name:	Printed name:		
Company:	Company:		
Date:	Date:	Time:	Number of Coolers: Cooler Temp(s): COC Seals Intact? Bottles Intact?

Limits of Liability: Analytical Resources, Inc. (ARI) will perform all requested services in accordance with appropriate methodology follow ARI Standard Operating Procedures and Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI releases ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the client.

Please sign here if you would like these samples disposed of after expiration of standard archive times (60 days for waters 90 days for soils, sediments per contract). If you do not want these samples discarded we will begin charging you for storage after the disposal date. **Samples to be discarded after expiration:**



**ORGANIC COMPOUND
DATA REPORTING QUALIFIERS**

- U Indicates the compound was undetected at the reported concentration. (Same as ND).
- J Indicates an estimated concentration when the value is less than the calculated reporting limit.
- D Indicates the surrogate/spike(s) was not detected, due to dilution of extract.
- NR Indicates the surrogate recovery cannot be reported due to matrix interference.
- E Indicates a value above the linear range of the detector. Sample dilution required.
- S Indicates no value reported due to saturation of the detector. Sample dilution required.
- NA Indicates compound not analyzed for.
- M Indicates an estimated value of analyte found and confirmed by analyst but with low spectral match.
- B Indicates possible/probable blank contamination. Flagged when the analyte is detected in the blank as well as the sample.
- Y Indicates raised reporting limit due to background interference or to activity on the instrument. Compound is still not detected at or above the raised level.
- C Indicates a probable hit that cannot be confirmed due to matrix interference (GC).
- P Indicates a high RPD for dual column GC analyses without obvious interference.

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1


Sample ID: MB-021703

METHOD BLANK

Lab Sample ID: MB-021703

LIMS ID: 03-1519

Matrix: Sediment

Data Release Authorized: 

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/18/03 14:09

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 7.50 g

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

pH: NA

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	67 U
84-66-2	Diethylphthalate	67 U
84-74-2	Di-n-Butylphthalate	67 U
85-68-7	Butylbenzylphthalate	67 U
117-81-7	bis(2-Ethylhexyl)phthalate	67 U
117-84-0	Di-n-Octyl phthalate	67 U

Semivolatile Surrogate Recovery

d5-Nitrobenzene	64.7%
2-Fluorobiphenyl	70.2%
d14-p-Terphenyl	99.0%
d4-1,2-Dichlorobenzene	62.6%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Sample ID: ~~WELLS 1~~
~~SAMPLE~~

Lab Sample ID: FF56A

LIMS ID: 03-1519

Matrix: Sediment

Data Release Authorized: *MP*

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/18/03 15:40

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 1.17 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 41.9%

pH: 6.4

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	430 U
84-66-2	Diethylphthalate	430 U
84-74-2	Di-n-Butylphthalate	1,600
85-68-7	Butylbenzylphthalate	5,300
117-81-7	bis(2-Ethylhexyl)phthalate	170,000 E
117-84-0	Di-n-Octyl phthalate	4,100 M

Semivolatile Surrogate Recovery

d5-Nitrobenzene	57.6%
2-Fluorobiphenyl	70.4%
d14-p-Terphenyl	118%
d4-1,2-Dichlorobenzene	47.7%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Sample ID: ~~WISCONSIN~~ 1
DUBLINANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: FF56A

LIMS ID: 03-1519

Matrix: Sediment

Data Release Authorized: *A*

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/21/03 22:25

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 1.17 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 20.0

Percent Moisture: 41.9%

pH: 6.4

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	8,500 U
84-66-2	Diethylphthalate	8,500 U
84-74-2	Di-n-Butylphthalate	8,500 U
85-68-7	Butylbenzylphthalate	8,500 U
117-81-7	bis(2-Ethylhexyl)phthalate	150,000
117-84-0	Di-n-Octyl phthalate	8,500 U

Semivolatile Surrogate Recovery

d5-Nitrobenzene	34.4%
2-Fluorobiphenyl	73.6%
d14-p-Terphenyl	87.2%
d4-1,2-Dichlorobenzene	37.6%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Sample ID: WELLS 2

SAMPLE

Lab Sample ID: FF56B

LIMS ID: 03-1520

Matrix: Sediment

Data Release Authorized:

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/18/03 16:30

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 2.15 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 28.7%

pH: 6.7

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	230 U
84-66-2	Diethylphthalate	230 U
84-74-2	Di-n-Butylphthalate	2,000
85-68-7	Butylbenzylphthalate	4,100
117-81-7	bis(2-Ethylhexyl)phthalate	43,000 E
117-84-0	Di-n-Octyl phthalate	4,200 M

Semivolatile Surrogate Recovery

d5-Nitrobenzene	175%
2-Fluorobiphenyl	65.3%
d14-p-Terphenyl	72.5%
d4-1,2-Dichlorobenzene	39.2%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS


Page 1 of 1

Sample ID: **WELLS 2**
DILUTION

Lab Sample ID: FF56B

LIMS ID: 03-1520

Matrix: Sediment

Data Release Authorized: 

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/21/03 23:08

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 2.15 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 20.0

Percent Moisture: 28.7%

pH: 6.7

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	4,700 U
84-66-2	Diethylphthalate	4,700 U
84-74-2	Di-n-Butylphthalate	4,700 U
85-68-7	Butylbenzylphthalate	4,700 U
117-81-7	bis(2-Ethylhexyl)phthalate	37,000
117-84-0	Di-n-Octyl phthalate	4,700 U

Semivolatile Surrogate Recovery

d5-Nitrobenzene	48.0%
2-Fluorobiphenyl	75.2%
d14-p-Terphenyl	92.8%
d4-1,2-Dichlorobenzene	41.6%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS


Page 1 of 1

Sample ID: ~~Boyer-1~~
SAMPLE

Lab Sample ID: FF56C

LIMS ID: 03-1521

Matrix: Sediment

Data Release Authorized: 

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/18/03 17:18

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 2.67 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 28.8%

pH: 6.8

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	2,800
84-66-2	Diethylphthalate	4,600
84-74-2	Di-n-Butylphthalate	6,300
85-68-7	Butylbenzylphthalate	10,000
117-81-7	bis(2-Ethylhexyl)phthalate	53,000
117-84-0	Di-n-Octyl phthalate	6,100 M

Semivolatile Surrogate Recovery

d5-Nitrobenzene	92.4%
2-Fluorobiphenyl	57.0%
d14-p-Terphenyl	53.5%
d4-1,2-Dichlorobenzene	39.1%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS


Page 1 of 1

Sample ID: ~~Boxer 1~~~~DISCUSSION~~

Lab Sample ID: FF56C

LIMS ID: 03-1521

Matrix: Sediment

Data Release Authorized: 

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/21/03 23:56

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 2.67 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 20.0

Percent Moisture: 28.8%

pH: 6.8

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	3,700 U
84-66-2	Diethylphthalate	3,700 U
84-74-2	Di-n-Butylphthalate	4,800
85-68-7	Butylbenzylphthalate	6,400
117-81-7	bis(2-Ethylhexyl)phthalate	26,000
117-84-0	Di-n-Octyl phthalate	3,700 U

Semivolatile Surrogate Recovery

d5-Nitrobenzene	40.0%
2-Fluorobiphenyl	68.0%
d14-p-Terphenyl	80.8%
d4-1,2-Dichlorobenzene	31.2%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS


Page 1 of 1

Sample ID: Boyer 1MATRIX SPIKE

Lab Sample ID: FF56C

LIMS ID: 03-1521

Matrix: Sediment

Data Release Authorized: 

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/18/03 18:06

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 2.67 g-dry-wt

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: 28.8%

pH: 6.8

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	530
84-66-2	Diethylphthalate	---
84-74-2	Di-n-Butylphthalate	2,500
85-68-7	Butylbenzylphthalate	3,700
117-81-7	bis(2-Ethylhexyl)phthalate	45,000
117-84-0	Di-n-Octyl phthalate	190 U

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.4%
2-Fluorobiphenyl	263%
d14-p-Terphenyl	56.8%
d4-1,2-Dichlorobenzene	39.8%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Sample ID: Boyer 1

MATRIX SPIKE DUPLICATE

Lab Sample ID: FF56C

QC Report No: FF56-Seattle Public Utilities

LIMS ID: 03-1521

Project: Duwamish

Matrix: Sediment

Data Release Authorized: *[Signature]*

Date Sampled: 02/11/03

Reported: 02/24/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Sample Amount: 2.67 g-dry-wt

Date Analyzed: 02/18/03 18:54

Final Extract Volume: 0.5 mL

Instrument/Analyst: FINN8/PK

Dilution Factor: 1.00

GPC Cleanup: NO

Percent Moisture: 28.8%

pH: 6.8

CAS Number	Analyte	µg/kg
131-11-3	Dimethylphthalate	3,700
84-66-2	Diethylphthalate	---
84-74-2	Di-n-Butylphthalate	2,300
85-68-7	Butylbenzylphthalate	9,400
117-81-7	bis(2-Ethylhexyl)phthalate	48,000
117-84-0	Di-n-Octyl phthalate	190 U

Semivolatile Surrogate Recovery

d5-Nitrobenzene	94.3%
2-Fluorobiphenyl	76.1%
d14-p-Terphenyl	67.0%
d4-1,2-Dichlorobenzene	46.2%

ORGANICS ANALYSIS DATA SHEET

Semivolatiles by GC/MS

Page 1 of 1

Sample ID: Boyer 1
MS/MSD

Lab Sample ID: FF56C

LIMS ID: 03-1521

Matrix: Sediment

Data Release Authorized: *[Signature]*

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted MS/MSD: 02/17/03

Sample Amount MS: 2.67 g-dry-wt

MSD: 2.67 g-dry-wt

Date Analyzed MS: 02/18/03 18:06

Final Extract Volume MS: 0.5 mL

MSD: 02/18/03 18:54

MSD: 0.5 mL

Instrument/Analyst MS: FINN8/PK

Dilution Factor MS: 1.00

MSD: FINN8/PK

MSD: 1.00

GPC Cleanup: NO

Percent Moisture: 28.8%

pH: 6.8

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diethylphthalate	4610	0.0	4680	NA	1840	4680	NA	200%

Results reported in $\mu\text{g/kg}$

RPD calculated using sample concentrations per SW846.

NA-No recovery due to high concentration of analyte in original sample and/or
calculated negative recovery.

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by GC/MS
Page 1 of 1

Sample ID: LCS-021703
LAB CONTROL

Lab Sample ID: LCS-021703

LIMS ID: 03-1519

Matrix: Sediment

Data Release Authorized: *AP*

Reported: 02/24/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/18/03 14:52

Instrument/Analyst: FINN8/PK

GPC Cleanup: NO

Sample Amount: 7.50 g

Final Extract Volume: 0.5 mL

Dilution Factor: 1.00

Percent Moisture: NA

pH: NA

Analyte	Lab Control	Spike Added	Recovery
Diethylphthalate	1360	1670	81.4%

Semivolatile Surrogate Recovery

d5-Nitrobenzene	64.2%
2-Fluorobiphenyl	70.2%
d14-p-Terphenyl	89.0%
d4-1,2-Dichlorobenzene	60.4%

Results reported in $\mu\text{g/kg}$

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-021703
METHOD BLANK

Lab Sample ID: MB-021703
LIMS ID: 03-1519
Matrix: Sediment
Data Release Authorized: *MB*
Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: NA
Date Received: NA

Date Extracted: 02/17/03
Date Analyzed: 02/19/03 20:35
Instrument/Analyst: ECD1/YZ
GPC Cleanup: NO
Sulfur Cleanup: YES
Acid Cleanup: YES

Sample Amount: 12.0 g
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Florisil: NO
pH: NA
Percent Moisture: NA

CAS Number	Analyte	µg/kg
12674-11-2	Aroclor 1016	33 U
53469-21-9	Aroclor 1242	33 U
12672-29-6	Aroclor 1248	33 U
11097-69-1	Aroclor 1254	33 U
11096-82-5	Aroclor 1260	33 U
11104-28-2	Aroclor 1221	67 U
11141-16-5	Aroclor 1232	33 U

PCB Surrogate Recovery

Decachlorobiphenyl	91.8%
Tetrachlorometaxylene	71.2%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: ~~WELLS-1~~
~~SAMPLE~~

Lab Sample ID: FF56A

LIMS ID: 03-1519

Matrix: Sediment

Data Release Authorized: *MP*

Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/19/03 21:32

Instrument/Analyst: ECD1/YZ

GPC Cleanup: NO

Sulfur Cleanup: YES

Acid Cleanup: YES

Sample Amount: 6.97 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Florisil: NO

pH: 6.4

Percent Moisture: 41.9%

CAS Number	Analyte	µg/kg
12674-11-2	Aroclor 1016	57 U
53469-21-9	Aroclor 1242	57 U
12672-29-6	Aroclor 1248	57 U
11097-69-1	Aroclor 1254	130 Y
11096-82-5	Aroclor 1260	69 Y
11104-28-2	Aroclor 1221	110 U
11141-16-5	Aroclor 1232	57 U

PCB Surrogate Recovery

Decachlorobiphenyl	47.5%
Tetrachlorometaxylene	47.8%

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1


Sample ID: WELLS 1

MATRIX SPIKE

Lab Sample ID: FF56A

LIMS ID: 03-1519

Matrix: Sediment

Data Release Authorized: 

Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities

Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/19/03 22:00

Instrument/Analyst: ECD1/YZ

GPC Cleanup: NO

Sulfur Cleanup: YES

Acid Cleanup: YES

Sample Amount: 7.00 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Florisil: NO

pH: 6.4

Percent Moisture: 41.9%


CAS Number	Analyte	µg/kg
12674-11-2	Aroclor 1016	57 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	57 U
11097-69-1	Aroclor 1254	150 Y
11096-82-5	Aroclor 1260	74 Y
11104-28-2	Aroclor 1221	110 U
11141-16-5	Aroclor 1232	57 U

PCB Surrogate Recovery

Decachlorobiphenyl	52.0%
Tetrachlorometaxylene	49.2%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: WELLS 1
MATRIX SPIKE DUP

Lab Sample ID: FF56A
LIMS ID: 03-1519
Matrix: Sediment
Data Release Authorized: 
Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03
Date Received: 02/11/03

Date Extracted: 02/17/03
Date Analyzed: 02/19/03 22:28
Instrument/Analyst: ECD1/YZ
GPC Cleanup: NO
Sulfur Cleanup: YES
Acid Cleanup: YES

Sample Amount: 6.97 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Florisil: NO
pH: 6.4
Percent Moisture: 41.9%

CAS Number	Analyte	µg/kg
12674-11-2	Aroclor 1016	57 U
53469-21-9	Aroclor 1242	---
12672-29-6	Aroclor 1248	57 U
11097-69-1	Aroclor 1254	140 Y
11096-82-5	Aroclor 1260	95 Y
11104-28-2	Aroclor 1221	110 U
11141-16-5	Aroclor 1232	57 U

PCB Surrogate Recovery

Decachlorobiphenyl	43.5%
Tetrachlorometaxylene	47.8%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: WELLS 1
MS/MSD

Lab Sample ID: FF56A
LIMS ID: 03-1519
Matrix: Sediment
Data Release Authorized: *AB*
Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03
Date Received: 02/11/03

Date Extracted MS/MSD: 02/17/03

Sample Amount MS: 7.00 g-dry-wt
MSD: 6.97 g-dry-wt

Date Analyzed MS: 02/19/03 22:00
MSD: 02/19/03 22:28

Final Extract Volume MS: 4.0 mL
MSD: 4.0 mL

Instrument/Analyst MS: ECD1/YZ
MSD: ECD1/YZ

Dilution Factor MS: 1.00
MSD: 1.00

GPC Cleanup: NO
Sulfur Cleanup: YES
Acid Cleanup: YES

Florisil: NO
pH: 6.4
Percent Moisture: 41.9%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1242	< 57.4	319	571	55.9%	321	574	55.9%	0.6%

Results reported in $\mu\text{g/kg}$
RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: WELLS 2
SAMPLE

ANALYTICAL
RESOURCES
INCORPORATED

Lab Sample ID: FF56B

LIMS ID: 03-1520

Matrix: Sediment

Data Release Authorized: *RB*

Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Date Analyzed: 02/19/03 22:56

Instrument/Analyst: ECD1/YZ

GPC Cleanup: NO

Sulfur Cleanup: YES

Acid Cleanup: YES

Sample Amount: 8.58 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Florisil: NO

pH: 6.7

Percent Moisture: 28.7%

CAS Number	Analyte	µg/kg
12674-11-2	Aroclor 1016	47 U
53469-21-9	Aroclor 1242	47 U
12672-29-6	Aroclor 1248	47 U
11097-69-1	Aroclor 1254	100 Y
11096-82-5	Aroclor 1260	120
11104-28-2	Aroclor 1221	93 U
11141-16-5	Aroclor 1232	47 U

PCB Surrogate Recovery

Decachlorobiphenyl	51.2%
Tetrachlorometaxylene	47.5%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: Boyer 1
SAMPLE

Lab Sample ID: FF56C

QC Report No: FF56-Seattle Public Utilities

LIMS ID: 03-1521

Project: Duwamish

Matrix: Sediment

Data Release Authorized: *MS*

Date Sampled: 02/11/03

Reported: 02/25/03

Date Received: 02/11/03

Date Extracted: 02/17/03

Sample Amount: 8.58 g-dry-wt

Date Analyzed: 02/19/03 23:24

Final Extract Volume: 4.0 mL

Instrument/Analyst: ECD1/YZ

Dilution Factor: 1.00

GPC Cleanup: NO

Florisil: NO

Sulfur Cleanup: YES

pH: 6.8

Acid Cleanup: YES

Percent Moisture: 28.8%

CAS Number	Analyte	µg/kg
12674-11-2	Aroclor 1016	47 U
53469-21-9	Aroclor 1242	47 U
12672-29-6	Aroclor 1248	47 U
11097-69-1	Aroclor 1254	47 U
11096-82-5	Aroclor 1260	66
11104-28-2	Aroclor 1221	93 U
11141-16-5	Aroclor 1232	47 U

PCB Surrogate Recovery

Decachlorobiphenyl	49.5%
Tetrachlorometaxylene	45.2%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-021703
LAB CONTROL

Lab Sample ID: LCS-021703
LIMS ID: 03-1519
Matrix: Sediment
Data Release Authorized: *AS*
Reported: 02/25/03

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03
Date Received: 02/11/03

Date Extracted: 02/17/03
Date Analyzed: 02/19/03 21:03
Instrument/Analyst: ECD1/YZ
GPC Cleanup: NO
Sulfur Cleanup: YES
Acid Cleanup: YES

Sample Amount: 12.0 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 1.00
Florisil: NO
pH: NA
Percent Moisture: NA

Analyte	Lab Control	Spike Added	Recovery
Aroclor 1242	266	333	79.9%

PCB Surrogate Recovery

Decachlorobiphenyl	88.0%
Tetrachlorometaxylene	71.8%

Results reported in $\mu\text{g/kg}$

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Method Blank

Lab Sample ID: FF56MB

QC Report No: FF56-Seattle Public Utilities


LIMS ID: 03-1520

Project: Duwamish

Matrix: Sediment

Date Sampled: NA

Date Received: NA

Data Release Authorized: 

Reported: 02/19/03

Percent Total Solids: NA


Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	02/12/03	6010B	02/14/03	7440-38-2	Arsenic	5	5 U
3050B	02/12/03	6010B	02/14/03	7440-43-9	Cadmium	0.2	0.2 U
3050B	02/12/03	6010B	02/14/03	7440-50-8	Copper	0.2	0.3
3050B	02/12/03	6010B	02/14/03	7439-92-1	Lead	2	2 U
CLP	02/12/03	7471A	02/17/03	7439-97-6	Mercury	0.05	0.05 U
3050B	02/12/03	6010B	02/14/03	7440-66-6	Zinc	0.6	0.6 U

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: WELLS 1

Lab Sample ID: FF56A
LIMS ID: 03-1519
Matrix: SedimentQC Report No: FF56-Seattle Public Utilities
Project: DuwamishDate Sampled: 02/11/03
Date Received: 02/11/03Data Release Authorized: 

Reported: 02/19/03

Percent Total Solids: 50.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	02/12/03	6010B	02/18/03	7440-38-2	Arsenic	20	30
3050B	02/12/03	6010B	02/18/03	7440-43-9	Cadmium	1.0	9.0
3050B	02/12/03	6010B	02/18/03	7440-50-8	Copper	1.0	527
3050B	02/12/03	6010B	02/18/03	7439-92-1	Lead	10	157
CLP	02/12/03	7471A	02/17/03	7439-97-6	Mercury	0.09	0.12
3050B	02/12/03	6010B	02/18/03	7440-66-6	Zinc	3	2,570

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



Lab Sample ID: FF56A
LIMS ID: 03-1519
Matrix: Sediment

Sample No: WELLS 1
QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Received: 02/11/03

Data Release Authorized: *[Signature]*

Reported: 02/19/03

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010B	30	400	380	97.4%	
Cadmium	6010B	9	101	95	96.8%	
Copper	6010B	527	620	95	97.9%	H
Lead	6010B	160	530	380	97.4%	
Mercury	7471A	0.12	0.92	0.85	94.1%	
Zinc	6010B	2570	2500	95	-73.7%	H

'Q' codes:

N = control limit not met
H = %R not applicable, sample concentration too high
* = RPD control limit not met
NA = Not applicable - analyte not spiked

Control Limits: Percent Recovery: 75-125%
RPD: +/-20%

INORGANIC ANALYSIS DATA SHEET
TOTAL METALS



Lab Sample ID: FF56A Sample No: WELLS 1
LIMS ID: 03-1519 QC Report No: FF56-Seattle Public Utilities
Matrix: Sediment Project: Duwamish
Date Received: 02/11/03
Data Release Authorized *[Signature]*
Reported: 02/19/03

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample mg/kg-dry	Duplicate mg/kg-dry	RPD	Control Limit	Q
Arsenic	6010B	30	20 U	40%	+/- 20	L
Cadmium	6010B	9.0	8.9	1.1%	+/- 20 %	
Copper	6010B	527	442	17.5%	+/- 20 %	
Lead	6010B	157	138	12.9%	+/- 20 %	
Mercury	7471A	0.12	0.17	34.5%	+/- 0.09	L
Zinc	6010B	2570	2930	13.1%	+/- 20 %	

'Q' codes: * = control limit not met
 L = RPD not valid, alternate limit = detection limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: WELLS 2

Lab Sample ID: FF56B

QC Report No: FF56-Seattle Public Utilities


LIMS ID: 03-1520

Project: Duwamish

Matrix: Sediment

Date Sampled: 02/11/03

Date Received: 02/11/03

Data Release Authorized 

Reported: 02/19/03

Percent Total Solids: 71.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	02/12/03	6010B	02/17/03	7440-38-2	Arsenic	20	20 U
3050B	02/12/03	6010B	02/17/03	7440-43-9	Cadmium	0.7	5.2
3050B	02/12/03	6010B	02/17/03	7440-50-8	Copper	0.7	312
3050B	02/12/03	6010B	02/17/03	7439-92-1	Lead	7	421
CLP	02/12/03	7471A	02/17/03	7439-97-6	Mercury	0.06	0.10
3050B	02/12/03	6010B	02/17/03	7440-66-6	Zinc	2	729

U Analyte undetected at given RL

RL Reporting Limit


INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample No: Boyer 1

Lab Sample ID: FF56C
LIMS ID: 03-1521
Matrix: Sediment

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Date Sampled: 02/11/03
Date Received: 02/11/03

Data Release Authorized 
Reported: 02/19/03

Percent Total Solids: 70.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	RL	mg/kg-dry
3050B	02/12/03	6010B	02/17/03	7440-38-2	Arsenic	20	20
3050B	02/12/03	6010B	02/17/03	7440-43-9	Cadmium	0.7	6.3
3050B	02/12/03	6010B	02/17/03	7440-50-8	Copper	0.7	368
3050B	02/12/03	6010B	02/17/03	7439-92-1	Lead	7	308
CLP	02/12/03	7471A	02/17/03	7439-97-6	Mercury	0.06	0.13
3050B	02/12/03	6010B	02/17/03	7440-66-6	Zinc	2	1,120

U Analyte undetected at given RL

RL Reporting Limit

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS



Lab Sample ID: FF56LCS
LIMS ID: 03-1520
Matrix: Sediment

QC Report No: FF56-Seattle Public Utilities
Project: Duwamish

Data Release Authorized: *OM*

Reported: 02/19/03

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike mg/kg-dry	Spike Added	% Recovery	Q
Arsenic	6010B	182	200	91.0%	
Cadmium	6010B	46.0	50.0	92.0%	
Copper	6010B	46.7	50.0	93.4%	
Lead	6010B	186	200	93.0%	
Mercury	7471A	1.03	1.00	103%	
Zinc	6010B	46.5	50.0	93.0%	

'Q' codes: N = control limit not met

Control Limits: 80-120%